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> >
> > I'd appreciate it if you could look at the following:
> > (1) I've included quotes from individuals that participated in the test sessions. Please let me know if you feel any of these quotes are either identifiable (they should be anonymous) or could be taken in a bad way.
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> > --Lynne

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Learning from Project Experiences Using a Legacy-based Approach

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Abstract

As project teams become used more widely, the question of how to capitalize on the knowledge learned in project teams remains an open issue. Using previous research on shared cognition in groups, an approach to promoting post-project learning was developed. This Legacy Review concept was tested on four in tact project teams. The results from those test sessions were used to develop a model of team learning via group cognitive processes. The model and supporting propositions are presented

Introduction

Knowledge is critical to organizational success (Grant, 1996; Nonaka,1994). As organizations increasingly turn to projects to organize work (Mankin, Cohen, & Bikson,1996), knowledge and learning become critical organizational outcomes from project activities. The very nature of projects, however, makes it difficult for organizations to fully capitalize on these outcomes. That is, projects are formed to accomplish a specific goal, skills and resources are focused on accomplishing this goal, and then the project is disbanded after completion with members moving on to other assignments (Cohen & Bailey 1997). As a result, incidental activities such as learning or codifying knowledge which have organizational benefits but aren't required for project success may receive little attention from project members.

The lack of attention to learning and knowledge outcomes also exists in the literatures on product development and teams/groups. In the product development literature, Brown & Eisenhardt (1995) identified multiple project-level outcomes which they classify as: *Process performance*, e.g., speed and productivity of product development; *Product effectiveness*, e.g., the fit of the product with firm competencies and market needs; and *Financial success*, e.g., success of the product in terms of revenue, profitability, and market share. The team/group literature also considers process performance components such as meeting cost and schedule constraints, but also include management assessment of performance and attitudinal (e.g., satisfaction) and behavioral measures (e.g., absenteeism) at the individual or aggregated team level (Cohen & Bailey, 1997).

In the product development and group literatures, learning, gaining experience, and generating new knowledge are rarely studied as project team processes, and studied even less *as project outcomes*. Given the critical importance of knowledge in today's business environment, it is important to understand how projects can lead to learning and knowledge generation, and how these learning processes can be improved. In particular, it is important to understand how the knowledge contributions (which we call "legacies") from a project team are "learned" so they can be reused by others in the organization. This paper explores the question of how to improve learning, experience, and knowledge outcomes in project teams. We first review the literature on team processes that may contribute to learning in project teams. We then develop an approach to improve learning in project teams based on expertise coordination and knowledge reuse. Next, we use the results from a series of pilot activities to explore the proposed approach using intact project teams from a large R&D organization. Finally, we propose a model for knowledge development and learning in project teams, and discuss the implications of this work for future research and practice.

Background

Learning results from a combination of action and reflection (Kelly, 1970). The actions associated with doing project work provide experiences which set the stage for learning. However, closing the learning loop requires thinking about and reflecting on those experiences. The following section presents a discussion of three key concepts from the literature on group cognition which could provide insight into potential learning mechanisms and processes for project teams: transactive memory, shared understanding, and sensemaking.

Transactive Memory

A transactive memory system (TMS) is "a combination of the knowledge possessed by particular group members and an awareness of who knows what" and often "develops as a result of shared experiences [which] lead people to encode, store, and retrieve relevant information together" (from Wegner, 1986; cited in Liang et al., 1995, p. 385). As members of a group work together, their combined experiences may be captured in a form of group memory. Liang, et al. (1995) demonstrated, in a laboratory experiment involving the assembly of radios, that work groups whose members were trained together recalled more about the assembly procedure and produced better-quality radios than groups whose members were trained alone. Results of additional analysis indicated that group training improved group performance primarily by fostering the development of transactive memory systems (a combination of the knowledge possessed by particular group members and an awareness of who knows what) among group members. When members were trained together, they were more likely to recall different aspects of the task, coordinate their task activities, and trust one anothers' expertise.

There are three factors associated with the operation of a TMS: (1) memory differentiation: the tendency for group members to specialize in remembering different

aspects of the work process; (2) task coordination: ability of group members to work together efficiently; and (3) task credibility: the level of trust among group members in one another's knowledge (Liang, et al., 1995). Other research has shown that expertise recognition is an important part of transactive memory because it guides group members to evaluate whatever information they obtain by considering its sources (Moreland, 1999).

In workplace situations, however, team members often arrive with a set of pre-developed skills and in the absence of specialized training activities are limited to developing transactive memory through other means. Stasser, Stewart, and Wittenbaum (1995) found that simply informing others about one's own expertise had little impact on group performance, which implies the importance of other sources of evidence that people use to infer what knowledge is shared or uniquely held. Clark and Marshall (1981) identify three: *Linguistic evidence* – what they have heard as participants in the same conversation; *Perceptual evidence* – experiences they have had in each other's presence; and *Community membership* – common knowledge believed or supposed in the groups to which they believe both of them belong. Transactive retrieval then occurs through a four stage process of (1) comparison (*who knows*), (2) establishing expertise (*who should know*), (3) searching for information (*using cues*), and (4) communicating knowledge (Hollingshead, 1998).

Research on transactive memory in groups is scarce and centers on tasks that are not much like those faced by most workers (Moreland, 1999). Work-related research has focused on the training of new skills in a laboratory setting (Liang, et al., 1995) rather than the development of the TMS over the natural lifecycle of a team. How transactive memory systems function at the organizational-level (vs. group-level) where there is a larger and more distributed amount of knowledge (Moreland, 1999) is an open area for research. Project-based organizations continuously assign and reassign team members to support project lifecycles. These actions can serve to either disseminate knowledge (e.g., Allen 1997) or concentrate it (e.g., Weick & Roberts, 1993), depending on how the individuals in the TMS are distributed.

Shared Understanding

The development, maintenance, and use of transactive memory represent one form of group cognition, used to support the recall and retrieval of knowledge. Other researchers have investigated the shared meaning assigned to group knowledge and experiences. For example, McComb, et al. (1999) show that not only are clear, concise goals important for team performance but they are also important for team members and the organization to have a shared understanding of what is required. A precondition for creating that shared understanding is a shared foundation of the knowledge and terminology that each participant assumes is known by other participants that enables them to communicate (Krauss & Fussell, 1996). This *common ground* includes not just information, but also beliefs and attitudes (Clark, 1996). Communication processes also play a pivotal role in creating "shared reality." According to Higgins (1999), "our individual experiences are established as valid and reliable to the extent that they are

shared with others...just as repeated observation of a phenomenon gives it statistical reliability (Hardin & Higgins, 1996) " (p.42).

Sensemaking

Extending beyond other explanatory processes such as understanding, interpretation, and attribution, is Weick's (1993) concept of sensemaking. Sensemaking is defined as "an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs" (p. 635) and has seven distinguishing characteristics (Weick, 1995, p. 17-61). Sensemaking is:

1. Grounded in identity construction. The establishment and maintenance of identity is a core preoccupation in sensemaking, because the individual's sense of identity shifts based on his or her interactions.
2. Retrospective. The creation of meaning is an attentional process that attends to what has already happened.
3. Enactive of sensible environments. In organizational life, people often produce part of the environment they face. Sensemaking keeps action and cognition together.
4. Social: Sensemaking is never solitary because what a person does internally is contingent on others.
5. On-going. Sensemaking never starts...[because] pure duration never stops. To understand sensemaking is to be sensitive to the ways in which people chop moments out of continuous flows and extract cues from those moments.
6. Focused on and by extracted cues, which are simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring. What an extracted cue becomes depends on context.
7. Driven by plausibility rather than accuracy. Sensemaking is about plausibility, pragmatics, coherence, reasonableness, creation, invention, and instrumentality. The criterion of accuracy is secondary

Sensemaking, and other processes aimed at developing shared cognition, can be affected by a variety of factors. First, because what is being interpreted has already happened, anything that affects remembering will impact the sense that is made (Weick, 1995). A large body of work in behavioral decision making (e.g., Tversky & Kahneman, 1974) has identified numerous heuristics that result in biased recall. Similarly, the "thought worlds" of team members from different disciplines lead to different, and often conflicting, characterizations of team decisions (Dougherty, 1992).

Second, whatever is currently occurring will influence the attention paid and what is discovered when looking backward from a specific point in time (Weick, 1995). Even within a single project, there are multiple ways in which the team can "chop" up time. Given the diversity of team participation (e.g., part/full time; membership that comes and goes over time based on need; Ancona & Caldwell, 1998), and cycles in project development (Baird, Morore, & Jagodzinski, 2000), what is learned will be dependent upon who is involved, when it occurs, and events that are occurring outside the project team.

Third, the actual process can impact the development of shared cognition. Weick (1995) states that "people who make sense are just as likely to satisfice as are people who make decisions" (p.42). Therefore, the more difficult or unpleasant the process, the less likely team members are to fully explore the past. Additional research is needed to understand how prior beliefs and interactional dynamics interact in the construction of shared cognition (Krauss & Fussell, 1996).

Finally, the larger and more complex the project, the larger the potential diversity of team member experiences, and the fewer people who are likely to have a big picture of the overall activity. Sensemaking and other shared cognitive processes will be impacted by the variety of perspectives, thought worlds, and external influences of the team members. As Weick (1995, p.27) states, "The problem is that there are too many meanings, not too few. The problem faced by the sensemaker is one of equivocality not one of uncertainty. The problem is confusion, not ignorance. I emphasize this because those investigators who favor the metaphor of information processing often view sense making as they do most other problems, as a setting where people need more information. That is not what people need when they are overwhelmed by equivocality".

In summary, there are a variety of cognitive processes operating in teams, and hence in projects, which may impact learning. Our understanding of these processes are limited, but previous research suggests that the effectiveness of cognitive processes with respect to learning may be affected by who is involved in the learning activity, when it occurs, and how the learning activity is structured. Therefore, for learning to successfully occur, an approach is needed that addresses each of these factors. The next section describes one such approach.

The Legacy Review Approach

This section describes the approach developed to conduct what we call a *Legacy Review*. A Legacy Review is a work session where team members identify innovations and improvements they've made during their project that have potential value to future users. The general concept was developed in reaction to practitioner concerns about the usefulness of existing "lessons learned" practices (e.g., GAO, 2002). This concept was then refined based on insights gained from team/group, product development, and decision making literatures.

Who is involved

A significant body of research clearly identifies the importance of social processes on team effectiveness and decision making. Group discussion has been shown to aid in interpretation (Salancik & Pfeffer, 1977), combat rumination effects (Kramer, 1999), and improve team effectiveness (Hirokawa, 1980; Kim, 1997). Cooke et al (1999) recommend a holistic approach to soliciting team knowledge. Therefore, the approach is based on team discussion, rather than, for example, individual interviews.

The composition of participants is also important. Participation of members representing the different domains on the team is needed to ensure that their perspectives are included (e.g., Dougherty, 1992). Team membership, however, can sometimes be complicated. For example, different skills may be necessary during certain phases of a project, and not needed at all during other phases; or a given expertise may be needed throughout, but not full-time, leading to part-time or part-phase membership. Some combination of core team and peripheral membership often exists in project teams (Ancona & Caldwell, 1998), so the question becomes where to draw the line for participation.

The desire for complete coverage of the experience-base and functional perspectives of team members is offset by the potential impact on group dynamics. We feel it's important for the participants to feel that they can contribute to the discussion. First, with too large a group size, it becomes difficult for everyone to have the time to contribute. Second, those that were peripherally involved with the team may feel frustrated by not having something to contribute to large parts of the discussion. Therefore, we decided to seek participation by core team members. By definition (e.g., Ancona & Caldwell, 1998), the core team should consist of members that are either directly responsible for major parts of the project, or who serve as the key interface for work done outside the core team. To function effectively, we can also assume that the core team has evolved to a size that supports effective communication. Therefore, while compromising on having complete first-hand knowledge, use of the core team provides reasonable coverage within a workable group size.

When it occurs

As the name implies, a Legacy Review reflects on accomplishments at the end of an effort. But waiting until the very end of a project can prove detrimental as people become less able to remember specific details (e.g., Higgins, 1999 in Moreland, 1999). Projects often proceed through a series of phases, with various intermediate milestones occurring throughout the lifecycle (Baird et al., 2000). We chose to conduct our Legacy sessions following the completion of a significant milestone. Because projects can differ significantly (Shenhar, 1998), we left the determination of what was significant to the individual teams, but typical milestones could be completion of a preliminary design phase, a proof-of-concept technology demonstration, or delivery of an operational system. We felt it was important to hold the reviews far enough after the milestone so that people felt removed from the time pressures associated with the critical part of their work (e.g., Janis & Mann, 1977), but not no far removed that participants forgot details.

How it is structured

Research on knowledge reuse indicates that the knowledge itself, meta knowledge about it, and contextual information that enables it to be applied or adapted are important to enable future use (Majchrzak, et al., 2004). During the course of a project, numerous products and ancillary information are produced (Allen, 1977). While these artifacts can serve as useful aids in future use, additional information summarizing for example, what

exists, how and why certain decisions were made, and who has the knowledge to adapt it may be critical to help future users find, understand and interpret existing artifacts (Majchrzak, et al., 2004). Therefore, in addition to identifying the legacies, it is important to capture this contextual information.

A critical part of a transactive memory system is the knowledge of who knows what (Moreland, 1999). Expertise coordination (Faraj & Sproull, 2000) is knowing where expertise is needed, and bringing needed expertise to bear, where expertise is the specialized skills and knowledge that an individual brings to the team's task, and coordination refers to team situated interactions aimed at managing resources and expertise dependencies. Faraj and Sproull (2000) present 3 steps for expertise coordination which we incorporate into our Legacy Review approach:

1. Know the expertise: While team members develop this understanding while working together, we include an opportunity to explicitly discuss the roles and responsibilities of each team member.
2. Recognize need for expertise: During the legacy review, have the team focus on their contribution to the development of the legacy item, so that each person's role can be recognized.
3. Bring expertise to bear: Have each person discusses their contribution to specific legacies, using a framework of specific questions that need to be answered and viewgraphs filled out.

Additional considerations include being able to accomplish something productive in a reasonable time frame, to both minimize the burden on the participants and minimize the cost to the organization.

In summary, we considered the three questions of who, when and how, and developed an approach based on insights provided by the literature. We defined a Legacy Review as a work session for core team members, held reasonably soon after the completion of a major milestone, which involved identifying legacies and associated contextual information, including how each team member contributed their expertise to reaching the milestone. In the following section, we describe how we tested this approach through a set of pilot Legacy Review sessions.

METHOD

The purpose of our effort was to develop a legacy approach and to evaluate the feasibility of using it to support knowledge capture at critical points in projects. This exploratory research was conducted as a series of test cases using in-tact project teams.

Project teams were recruited through managers in the organization. Managers were asked to identify teams that were small (2-12 people), that had completed a significant milestone within the past 6 months, that were considered successful, and that had developed a product considered innovative. Of the nine teams contacted based on

manager recommendations, all were interested in participating, but only four were available during the necessary timeframe.

We conducted four test Legacy sessions over a 3-week period. Team leaders provided the names of core team members. Each person received an email invitation to participate, along with an information sheet describing the sessions and an account code to cover the time they spent participating. A description of the teams is given in Table 1. The teams varied in the type of product they produced, the stage of development (product maturity), and the use of new technology. While all core team members were invited (and in most cases agreed to participate), last minute conflicts resulted in decreased team member participation. Table 1 identifies the number of actual participants, the number of core team members invited, and the total number of core + peripheral members identified by the team.

	Number of team members					Number of Legacies Identified		
Team	Partici-pants	Core	Core + Peri-pheral	Most Recent Milestone	Degree of product maturity/ technology	Pro-duct	Pro-cess	Peo-ple
Electronics-1	2	6	12	Delivery of operational system to provide power electronics for Mars mission	Most mature, high technology	2	5	2
Electronics-2	4	4	10	Delivery of proof of design for switching electronics technology	Medium mature, high technology	2	1	2
Software	2	6	6	Delivery of operational system for web-based conference paper review	Most mature, low technology	1	4	2
Sensor	2	5	8	Prototype of sensor technology	Least mature, high technology	2	1	3

Table 1. Team Descriptions

Each Legacy Review session was facilitated by the lead author following a detailed script, to ensure consistency of process between groups. The sessions were scheduled to last 90 minutes and consisted of four parts. The first part was brainstorming to identify potential legacies. Team members were given representative examples of each type of legacy, then asked to generate possible legacy items based on their experiences. We went around the table soliciting ideas, giving each person multiple opportunities to contribute until the ideas ran out. Next, team members synthesized the results by combining like items, culling out items that clearly didn't fit, and then categorizing the results based on product, process, people (relationship) or other. From the resulting list, the team was asked to select one item, preferably a product legacy, for more detailed discussion.

The third segment was a detailed discussion about the chosen legacy item. The discussion was structured to first identify core team members. Then, for each member,

both the individual (if present) and the other members of the team were asked to identify the role that person played on the team relative to the legacy item. Next, this segment continued with a discussion of the critical issues (e.g., challenges, risks, assumptions, design drivers) that were important to each individual on the team. This segment then concluded with a discussion of areas where the team got lucky – or unlucky – during the development, and any recommendations they have regarding reuse of the legacy.

The fourth, and final, segment of the Legacy Review was the completion of a viewgraph package summarizing the team's discussion. Teams were provided with a template and asked to fill in the items, listed in Table 2.

Section	**Detailed content**
1. List of team members	Participants; Core and peripheral members
2. Project description	Name, description, most recent milestone
3. Project legacies	Product, Process, People
4. Overview of specific legacy	Name, description, innovation, cost investment, time investment
5. Key decisions	Design drivers, assumptions, key alternatives, criteria used for evaluation, issues and risks
6. Results and products	Key documents
7. Areas where lucky/unlucky	
8. Potential Future application	Advice to future users
9. Conclusions and Institutional Summary	This (is/is not) a good example for cost analogies This (is/is not) a good example for schedule analogies The documentation (is/is not) mature, complete, accurate, accessible This effort (did/did not) stress institutional facilities This effort (did/did not) stress institutional capabilities

Table 2. Legacy Review Output Template

The day following the team's Legacy Review session, team members were sent a survey form (Appendix 1) and a copy of the output product (the viewgraph template, filled in for their project). We received completed surveys from 9 out of the 10 participants.

RESULTS

The reaction to the Legacy Review sessions was generally positive, with 90% of participants finding something of value in the session and 78% of the participants indicating that it was a worthwhile experience. All teams identified legacies in each of the categories, and 67% of participants felt that the information captured could be useful to others.

As is to be expected, different participants found different aspects of the sessions most valuable. Respondents specifically indicated: "sharing thoughts with the group," "brainstorming potential legacy items," getting "feedback from others regarding their perception of my contribution," and "think[ing] about two areas I had not given any

thoughts to." Some participants found it uncomfortable to talk about other members of the team and were concerned about possibly offending them.

When asked *would it would be valuable for the organization to conduct Legacy Review sessions at the end of key project phases*, all respondents indicated that it would. Respondents specifically recommended conducting the sessions "as soon as possible after the key project phases" and "only a couple of weeks after the project has occurred." Timing was considered important so team members "would still remember key ideas about the project," and "are still available." Respondents also indicated that participation by a greater number of team members is desirable: "a larger team would have generated more legacies;" "had all people from the team attended the session, I think that it would have been very useful to the non-core team members that did not know the entire history."

While feedback from participants identified areas for improvement, it also clearly indicated that the Legacy Review session approach developed on this project had potential value for the both the individual team members and the organization.

One unexpected result based on observation of the team sessions was the fundamental assumption expressed in team member discussions that the team members would be involved in any future application of their work. Team members clearly indicated that they would either expect the team to be employed intact to further develop their product, or that others wanting to adapt their product would consult with them. This is consistent with concepts of individual ownership of information and expertise (e.g., Jarvenpaa & Staples, 2001), and of how knowledge reuse occurs for innovation (Majcharzak, et al, 2004), but raises a knowledge management question regarding underlying assumptions in knowledge capture.

DISCUSSION

The legacy approach taken in this research can be represented by the model shown in Figure 1. Current research shows that projects directly produce financial, process, product, and team outcomes (Brown & Eisenhardt, 1995; Cohen & Bailey, 1997). Projects also lead to indirect outcomes for the organization and for individuals that can be categorized as "learning" outcomes. The model proposes that team learning via group cognitive processes, such as the Legacy Review sessions described in this paper, should have a positive impact on these learning outcomes. In turn, the effectiveness of the group cognitive processes will be impacted by the participants, timing, and structure of the activity.

The four Legacy Review test sessions can be considered revelatory cases (Yin 1994), which provide the opportunity to develop new theory about learning outcomes resulting from project teams. Although the results are anecdotal due to the small sample size, there is practical utility from this research for identifying a new approach that organizations can use to capture knowledge generated in project teams, particularly to support knowledge reuse. The academic utility, however, needs to be judged by the

degree to which it fosters new insights and stimulates new questions and propositions for future research (Eisenhardt 1989). The following section addresses the potential impact of this work on future research.

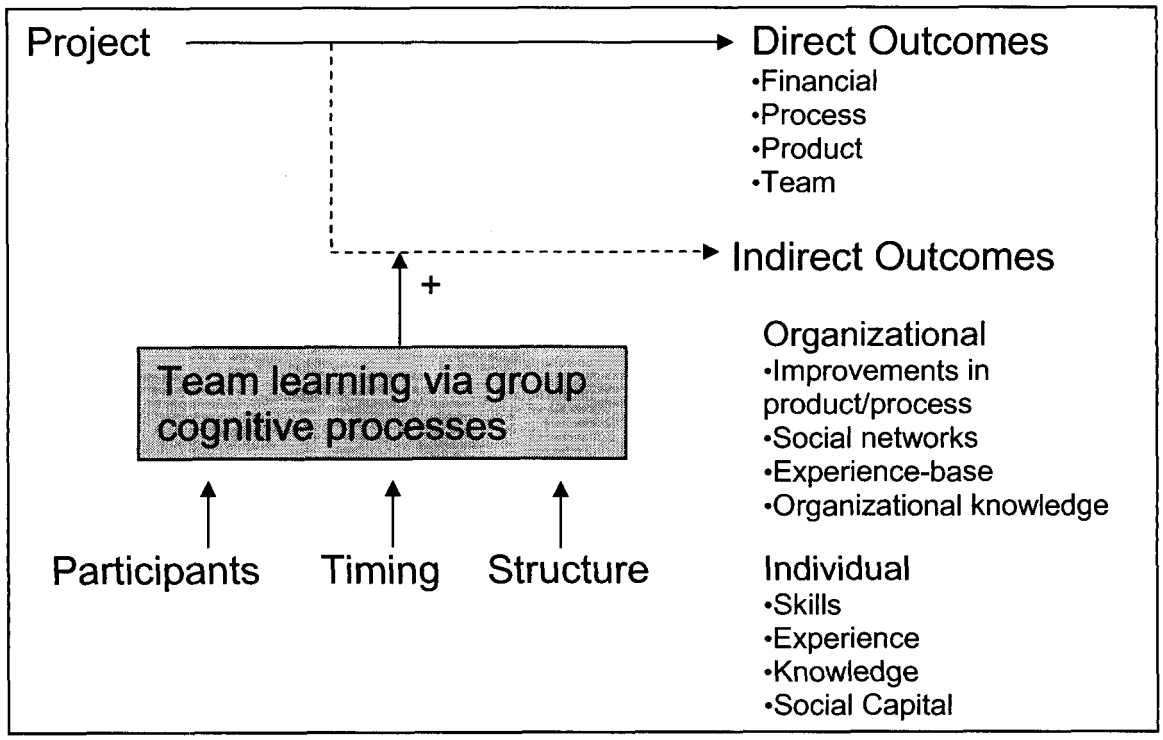

Figure 1. Team learning via group cognitive processes improves indirect project Outcomes

FUTURE RESEARCH

Studying how organizations learn from their projects – and how to improve this learning – is an area ripe for future research. The model presented in Figure 1 provides a framework for future research.

1. What does it mean to "learn" from a project. According to the dictionary, "learn" means *to gain knowledge or understanding of or skill in by study, instruction, or experience* (Merriam-Webster On-line, 2004). The Legacy Review approach equates learning with explicitly identifying changes in product, process, or relationships with potential for future reuse. By participating in a project, team members are assumed to have improved their skills, gained knowledge, and developed a greater understanding of both the processes used to create the product, and the capabilities of the people they worked with on the project. By participating in a Legacy Review session, participants reflect on their experiences and are predicted to develop a more complete

and accurate shared understanding of what they learned individually during the project.

Results from the four cases studied in this research indicate that participants felt that the Legacy sessions were valuable, but did not assess whether they actually learned anything. Additional study is needed to identify if learning occurred. For example, did participating in Legacy Review sessions improve team members' ability to recall details? Did it improve the team's ability to adapt their legacies? Did it enable knowledge transfer to others who were not part of the project team? Did it correct misconceptions developed during the project? Future research is needed to understand what constitutes the indirect project outcome of learning and how to measure this learning,

Proposition 1: *Project teams that do post-project reflection will learn more than project teams that do not do post-project reflection.*

2. The Legacy Review session was structured to promote discussion, expertise coordination, and the identification of legacies with reuse potential. The underlying assumption was that this structure would lead to more productive sessions and a greater degree of learning. This assumption, however, was untested. While participant comments specifically addressed elements of structure (who should participate, when the sessions should be held, value of thinking about specific questions such as risks and where the project was lucky or unlucky), there is no supporting evidence to determine whether a structured session produced more learning than an unstructured session would have. That is, would there be a substantive difference in learning between a group that followed the Legacy Review approach and one that simply assembled the team for an open discussion following completion of a major milestone?

   Structure encompasses a number of concepts, as reflected in the following propositions:

   Proposition 2: *Project teams that take a structured approach to post-project reflection will learn more than those that use an ad hoc approach.*

   Proposition 2a: *Reflection activities structured to include both core and peripheral members will result in more learning than those that include just core members.*

   Proposition 2b: *Reflection activities that occur soon after completion of a project milestone will result in more learning than those that occur later.*

   Proposition 2c: *Reflection activities that focus on reuse will result in more learning than those that do not.*

3. The teams that participated in the Legacy Review test sessions were all successful in completing a major milestone. It is a common belief, however, that people learn

more from their mistakes or failures. From that perspective, one could expect that an unsuccessful team may benefit *more* from a Legacy Review session than a successful one. Each of the wrong paths taken by the unsuccessful team represents a unique learning opportunity, and therefore more potential legacies. Conversely, a successful team is one that has met the goals of the project, and produced the desired product. The reuse potential of the changes to process, product, and relationships from a successful effort could be expected to be much higher than those from a project that failed. Clearly, both successful and unsuccessful teams have learning potential, which leads to:

Proposition 3: *Successful and unsuccessful teams will benefit equally by engaging in reflection activities.*

4. The amount of new learning that can occur during a Legacy-type session will be bounded by the project team's experiences during the actual project. Assuming equivalent project results, it can be inferred that a highly cohesive team would have evolved mechanisms for effectively sharing information throughout the lifecycle of the project. The members of a cohesive team will therefore have less to learn because they have already been involved in extensive sharing and team building activities, which leads to:

   Proposition 4: *Highly cohesive teams will report less satisfaction with and fewer learning results from reflection activities than non-cohesive teams.*

In conclusion, while the results reported in this paper are limited by their anecdotal nature, they do provide insights into the potential benefits of conducting structured reflection-oriented activities following completion of a project. The proposed model and associated propositions provide a framework for future investigation. The value of improved learning from project teams could be enormous and this work presents both a practical and theoretical step forward in achieving it.

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Appendix 1: Legacy Session Feedback Survey

Thank you very much for participating in a Legacy Session Pilot. I greatly appreciate your support of this effort. The final step in the Pilot evaluation is to answer the following questions. These should take no longer than 15 minutes to answer and will provide valuable information to enable us to evaluate the effectiveness of the Legacy Session approach. Please answer the questions as honestly and completely as possible.

1. What did you feel was the most valuable part(s) of the Legacy Session?

2. What part(s) did you find frustrating, unproductive, or uncomfortable?

3. Were you surprised by anything that emerged during the session?

4. How useful do you think the information is for YOU?

5. How useful do you think the information would be to others?

6. Was this a worthwhile experience for you? Why/Why not?

7. How much time should be allocated for this type of activity?

8. Would it be valuable for JPL to conduct Legacy Sessions at the end of key project phases? If so, how would you recommend doing this?

9. Any other comments?

10. Do you have any questions or suggestions about the process/experience?

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